event in either of these classes is preceded by one in the other class, so that it is quite as proper to say that human events are forerunners of remarkable celestial phenomena as it is to reverse this statement. The article in the Managua Daily gives the proper optical explanation of the nature of the phenomena of halos as formed by the action of ice needles in thin cirrus clouds upon the beams of light from the sun; it also shows that halos are as often followed by good events as by evil, but it fails to bring out as clearly as is desirable the great principle that men must banish from their thoughts every tendency to imagine that meteorological phenomena have even the slightest value as prophetic signs or prognostics of future events among mankind.

FROST FORMATIONS AND ICE COLUMNS.

We are indebted to Prof. D. T. MacDougall, of the University of Minnesota, at Minneapolis, for the following references to recent publications on this subject, in continuation of the short notes published in the MONTHLY WEATHER REVIEW for May and July, 1897:

MacDougall, D. T. Science, 1893, Vol. XXII, p. 851.
MacDougall, D. T. Botanical Gazette, 1894, XIX, p. 120.
Ward, Prof. Lester F. Botanical Gazette, April, 1893.
Bay, J. C. Botanical Gazette, 1894, XIX, p. 321.

Professor MacDougall states that he expects to carry on some experimental work on plant life in the San Francisco mountain range near Flagstaff, Ariz., during the coming season. Any person in that vicinity who keeps meteorological records will confer a favor by corresponding directly with him. It is hoped that some one in that region or some institution will maintain a continuous thermograph record.

PRAIRIE SKIES.

The following extracts are from a recent letter by E. J. Couch, voluntary observer at Cornlea, Nebr.:

Our prairies have rains principally in spring and summer. A general absence of cloud in the surface current gives opportunity to observe the upper air currents. Observation leads to certain generalizations. The rains seem to have their origin principally in the air currents at moderate elevations. The surface clouds are generally fog, scud, or squall. In spring the whole upper atmosphere seems to lift; and the air currents bring moisture from an easterly or southerly direction which falls as rain at the front of a low or with a sudden fall in temperature. The summer rains at times are similar, but they arise often from thunderheads.

When thunderheads project into a current above that is calm, the cloud spreads out forming the anvil cumulus. In most cloud areas we note two or more motions. A roll or rotating motion and a forward motion; clouds expand or contract with advancing or closing day, or with increase or decrease in evaporation.

A NEW GAS IN THE ATMOSPHERE.

Prof. William Ramsay and Mr. Morris W. Travers announced to the Royal Society at London on June 9, and to the Academy of Sciences at Paris on June 6, their discovery of a new constituent of atmospheric air to which they propose to give the name "Krypton," referring to the fact that it has been so long concealed from our knowledge. On the other hand the French chemist Berthelot suggests the name "Eosium" on account of the distinctive bright green line in the spectrum of this new element. This line is in almost the same position as the green line in helium and, as was suggested by Professor Schuster as well as independently by Berthelot, this line also agrees with the green line of the aurora borealis. As physicists are agreed that the light of the aurora must come from an incandescent gas, although its temperature is low as compared with most of the incandescent substances that are dealt with in our laboratories, it would seem certain that the incandescence of "Krypton" does contribute to the brilliancy of the aurora. The following table gives approximately some idea of the relative proportions, both by volume and by weight, of the gases that have thus far been discovered in the lower portion of our atmosphere.

Near sea level, under a standard pressure of 760 mm. of mercury at 0° C. and standard gravity, the dry gases of the atmosphere have densities, volumes, and pressures as follows:

	Volumes.	Pressures.	Densities.	Weights.
	Per cent.	*Mm.*	*Kg. p. m².*	*Per cent.*
Oxygen	20.95	159.22	1.10563	23.16
Nitrogen	79.02	600.55	0.97137	76.77
Carbonic acid gas	0.03	0.23	1.5201-	0.046
Dry air	100.00	760.00	1.29322	99.976

The remaining constituents, argon, helium, krypton, and ammonia, represent quantities far less than carbonic acid gas. What these proportions may become 10 miles above the earth's surface can hardly be stated as yet. The relative density of the new gas, taking hydrogen as unity and oxygen as sixteen, is as follows:

Krypton, 32.321 cubic centimeters at pressure 521.85 millimeters and temperature 15.95° C. weighed 0.04213 gram, or a density of 22.47. A second determination gave 22.51.

Like argon and helium, krypton is probably monatomic; it is heavier than argon and less volatile than nitrogen, oxygen, and argon. But Professor Ramsay states that its density is at present problematic, and it may be that the gas belongs to the helium series and has a density of 40, with an atomic weight of 80. The spectrum of the gas is characterized by two very brilliant lines in the yellow besides the brighter green line before mentioned and a somewhat weaker green line. In order to obtain a small quantity of this gas for their observations, the authors state that they obtained about 750 cubic centimeters of liquid air; all but 10 cubic centimeters were allowed to evaporate away slowly; the residue was secured in a gas holder and after removing the oxygen and the nitrogen, there was left 26 cubic centimeters of a mixture of argon and krypton.

The authors conclude by saying: "We have already spent several months in preparation for a search for a gas lighter than nitrogen that may possibly be found in the air and will be able to state ere long whether this supposition is well founded."

SAMUEL E. BLACK.

Mr. Samuel E. Black, observer, Weather Bureau, died May 21, 1898. Mr. Black entered the meteorological service by detail from the Office of Director of Experimental Stations, Department of Agriculture, August 21, 1894, and July 31, 1895, was transferred to the Weather Bureau. He was assigned to duty as assistant at the station at Colorado Springs, Colo., until September 17, 1894, following which he served in the same capacity at Denver, Colo., until September 5, 1896, and then at Santa Fe, N. Mex., until the date of his death.

NOTES FROM THE REPORTS OF THE CLIMATE AND CROP SECTIONS.

ARIZONA.

Mr. Henry M. Gee, voluntary observer at Tombstone, notes that during May, "day after day the wind was easterly in the morning, south about noon, and southwest the rest of the day." Nearly all the other observers in Arizona report that the month has been very windy at least in the daytime, and in general they report that the prevailing direction was southwest.

If the diurnal change in the direction of the wind was at other stations similar to that at Tombstone, which is in the northeast corner of Arizona, it would constitute a general